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CAPSULE TYPE ENDOSCOPE SYSTEM FOR PROMPT IMAGE-DOWNLOAD BY TRIGGER

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a capsule type endoscope system, and more particularly to a capsule type endoscope system immediately transmitting the images of a digestive tract to display.

Description of the Related Art

[0002] Vessel diseases, digestive diseases and cancers are the main concerns for human being. Traditionally, endoscopies have been widely used for observing the digestive system in medical treatments. However, the endoscopies cannot catch all the images in the digestive system, such as small intestines. Even worse, patients do not feel comfortable during the medical processes. In order to solve the problems, capsule type endoscopies have been widely used in the industry.

[0003] FIGS. 1 and 2 are transmission configuration of the prior art capsule type endoscope system. Referring to FIGS. 1 and 2, the prior art capsule type endoscope system 100 comprises: a capsule type endoscope 110, a data recorder 120, an image processor 130 and a display 140. Generally, the capsule type endoscope 110 includes a capsule shell, an image sensor, a light emitting diode and an Ag_2O cell. In the prior art capsule type endoscope system 100, the capsule type endoscope 110 has a transmitter 112, and the data recorder 120 has a receiver 122 and a memory 124.

[0004] After being swallowed by a patient, the capsule type endoscope 110 catches the image of the patient's digestive tract, and transmits the image data to the receiver 122 of the data recorder 120 via the transmitter 112. Then the image data is processed and stored in the memory 124.

[0005] Referring to FIGS. 1 and 2, after the data transmission and storage thereof, the data recorder 120 is wirelined to the image processor 130. The image processor 130 accesses the image data from the memory 124 for displaying the images for medical treatments.

[0006] From FIGS. 1 and 2, the prior art method includes two stages. In the first stage, the capsule type endoscope catches, transmits and stores the image of the digestive tract. In the second stage, the image data is accessed and displayed. Because it takes about 8 hrs for the capsule type endoscope going through the digestive tract, the image data thereof cannot be caught immediately by the image processor 130. In other words, the prior art capsule type endoscope system cannot output image data from the data recorder 120 to the image processor 130 during the first stage and has to wait until the capsule type endoscope 110 has finished the data taking process, then transmits all the data to the data recorder 120. Only after the first stage is finished, the image data then can be displayed on the display 140.

SUMMARY OF THE INVENTION

[0007] Therefore, an object of the present invention is to provide a capsule type endoscope system, which can transmit the image of the digestive tract to the image processor immediately by triggering and display the image on the display for medical treatments.

[0008] The other object of the present invention is to provide a capsule type endoscope system, which transmits the image of the digestive tract to the image processor immediately via the transceivers triggered by the data recorder or the image processor thereof.

[0009] To achieve the objects above, the present invention discloses a capsule type endoscope system, adapted to transform an image of a digestive tract into an image data and to transmit the data, which comprises: a capsule type endoscope, a data recorder and an image processor. The capsule type endoscope has a first transceiver, wherein the capsule type endoscope is adapted to catch the image of the digestive tract and to transform the image into the image data. The data recorder has a second transceiver, a third transceiver and a memory, the second and the third transceivers coupled to the memory. Notably, the first transceiver of the capsule type endoscope transmits the image data to the second transceiver of the data recorder, which is stored in the memory and transmitted to the image processor by the third transceiver. In addition, the image processor above further comprises a fourth transceiver, adapted to receive the image data from the third transceiver.

[0010] To achieve the objects above, the present invention discloses a capsule type endoscope system, adapted to transform an image of a digestive tract into an image data and to transmit the data, which comprises: a capsule type endoscope, a data recorder, a fourth transceiver and an image processor coupled to the fourth transceiver. The capsule type endoscope has a first transceiver, wherein the capsule type endoscope is adapted to catch the image of the digestive tract and to transform the image into the image data. The data recorder has a second transceiver, a third transceiver and a memory, the second and the third transceivers coupled to the memory. Notably, the

first transceiver of the capsule type endoscope transmits the image data to the second transceiver of the data recorder, which is stored in the memory and transmitted to the fourth transceiver and the image processor by the third transceiver.

[0011] According to the preferred capsule type endoscope system of the present invention, the transmission between the first and the second transceivers is continuous.

[0012] According to the preferred capsule type endoscope system of the present invention, the system further comprises a trigger, disposed in the data recorder or the image processor.

[0013] According to the preferred capsule type endoscope system of the present invention, the transmission between the third and the fourth transceivers is triggered by the trigger.

[0014] According to the preferred capsule type endoscope system of the present invention, the system further comprises a display coupled to the image processor for displaying the image of the digestive tract.

[0015] In the capsule type endoscope system of the present invention, the image of the digestive tract is transmitted from the third transceiver to the fourth transceiver. After the processing of the processor, the image of the digestive tract can be displayed for medical treatment.

[0016] In order to make the aforementioned and other objects, features and advantages of the present invention understandable, a preferred embodiment accompanied with figures is described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIGS. 1 and 2 are transmission configuration of the prior art capsule type endosocpy system.

[0018] FIG. 3 is a schematic configuration showing an image data transmission of a preferred capsule type endoscope system of the present invention.

[0019] FIG. 4 is a schematic configuration showing an image data transmission of another preferred capsule type endoscope system of the present invention.

DESCRIPTION OF SOME EMBODIMENTS

[0020] FIG. 3 is a schematic configuration showing an image data transmission of a preferred capsule type endoscope system of the present invention. Referring to FIG. 3, the capsule type endoscope system 200 is adapted to transform an image of a digestive tract into an image data and to transmit the data. Following are the descriptions of the capsule type endoscope system 200.

[0021] Referring to FIG. 3, the capsule type endoscope system 200 comprises: a capsule type endoscope 210, a data recorder 220 and an image processor 230. The capsule type endoscope 210 has a first transceiver 212, wherein the capsule type endoscope 210 is adapted to catch the image of the digestive tract and to transform the image into the image data. Additionally, the capsule type endoscope system 200 of the present invention further comprises a display 240 coupled to the image processor 230 for displaying the image of the digestive tract caught by the capsule type endoscope 210. The capsule type endoscope 210 can be, for example, a MIA capsule type endoscope (Given, Isreal), which comprises a light emitting diode, an image sensor, an Ag_2O cell, and a transceiver in a space 30mm*11mm. The capsule type endoscope 210,

for example, catches two images for each second. Of course, the capsule type endoscope can be any other capsule type endoscopies.

[0022] The data recorder 220 has a second transceiver 222, a third transceiver 224 and a memory 226, the second and the third transceivers 222 and 224, respectively, coupled to the memory 226. Notably, the first transceiver 212 of the capsule type endoscope 210 transmits the image data to the second transceiver 222 of the data recorder 220. In the embodiment, the transmission between the first and the second transceivers 212 and 222, respectively, is continuous. The image data received by the second transceiver 222 is stored in the memory 226 and transmitted to the image processor 230 by the third transceiver 224.

[0023] In the embodiment, the image processor 230 comprises, for example, a fourth transceiver 240, adapted to receive the image data from the third transceiver 224. Of course, the image processor 230 may, for example, comprise a memory 234 for storing the image data from the fourth transceiver 232. Notably, in order to reduce the transmission time, it is preferred that a high speed transmission is applied between the third and the fourth transceivers 224 and 232, respectively.

[0024] Referring to FIG. 3, the capsule type endoscope system 200 of the embodiment further comprises a trigger 260, adapted to transmit a signal or an order for triggering the transmission between the third and the fourth transceivers 224 and 232, respectively. In other words, the transmission between the third and the fourth transceivers 224 and 232, respectively, is triggered by the trigger 260. In addition, the trigger 260 is disposed, for example, in the data recorder 220 or the image processor 230. Of course, the trigger 260 can also disposed in the other position of the capsule type endoscope system 200.

[0025] FIG. 4 is a schematic configuration showing an image data transmission of another preferred capsule type endoscope system of the present invention. Compared with FIGS 3 and 4, the second embodiment is similar to the first embodiment. The difference is that the fourth transceiver 250 is out of the image processor 230 and coupled thereto.

[0026] In the embodiment, the fourth transceiver 250 serves receiving the image data from the third transceiver 224, and the image data received therefrom are stored in the memory 234 of the image processor 230.

[0027] Accordingly, the capsule type endoscope system of the present invention comprises following advantages:

1. The capsule type endoscope system of the present invention displays the image of the digestive tract immediately upon trigger for medical treatments.

2. In the capsule type endoscope system of the present invention, the image of the digestive tract is transmitted from the third transceiver to the fourth transceiver wirelessly. After the processing of the processor, the image of the digestive tract can be displayed for medical treatment.

[0028] Although the present invention has been described in terms of exemplary embodiments, it is not limited thereto. Rather, the appended claims should be constructed broadly to include other variants and embodiments of the invention which may be made by those skilled in the field of this art without departing from the scope and range of equivalents of the invention.